

Thesis Work: Modeling and simulation of roof crush with emphasis on static roof strength

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Background

In the automotive industry efforts to reduce weight of a car body a trend has been to switch from low strength steel to high strength steel. With high strength steel the sheet metal thickness can be reduced and with reduced sheet metal thickness the static car body stiffness could undesirably be reduced. To be able to design a strong, light and stiff car body, we must be confident that the simulations that are performed to support the design work comply with the final physical verification test. Because of this, there is a need for improvement of the modelling, simulation and verification process of static roof strength.

Scope

In this work different methods for static roof strength modelling is to be studied, compared and verified. Potential approaches could be:

- Literature survey on roof crush with regards to IIHS test institute and their method.
- Modelling optimization using nonlinear FE analysis.
- Derive guidelines to the modelling process with respect to major contributors to static roof strength.

The goal is to improve the CAE modelling for static roof strength determination and optimization during the car program design phase.

The diploma work will include the following elements:

- CAE modelling in Ansa.
- Nonlinear FE-analysis in LS-DYNA.
- Write a guideline for the modelling process with respect to major contributors to static roof strength.
- Verification tests at three different levels; car body, car body with wind screen and complete vehicle.

Profile

- Mechanical engineering with focus on computational mechanics or similar
- English in writing
- Good knowledge and interest of FE-analysis and optimization
- Curious and with an ability to work independently

Application

We would like you to use the electronic link further down in this ad.

Please apply with: CV, cover letter and grades.

Duration

- Starting date in January 2018
- ECTS (Academic Credits/"Högskolepoäng") 30 ECT
- For 2 students
- Work will be done at dep 93710 Principal Engineering. Volvo Car Corporation, Torslanda

Please contact:

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We want your application at the latest 2017-11-30.

Use the electronic application-form at <https://group.volvocars.com/careers/browse-our-jobs>

